

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-45 (Canceled)

46 (Currently Amended). A heat treatment method comprising:

supplying a gas from an upstream side of a reaction chamber;

heating the gas by using heat treatment means located on the upstream of the reaction chamber, and making the gas flow downstream; and

heating a substrate to be processed arranged on a downstream side of the reaction chamber so that the gas is provided to the substrate from a upside of a surface of the substrate while circulating the gas from the downstream side of the reaction chamber to the upstream side.

47 (Original). A method according to claim 46, wherein said gas is selected from nitrogen and rare gases.

48 (Original). A method according to claim 46, wherein said gas is one of reducing gases.

49 (Original). A method according to claim 46, wherein said gas is one of oxidizing gases.

50 (Currently Amended). A heat treatment method comprising:

supplying a gas from an upstream side of a reaction chamber;

heating the gas by using a heat treatment means formed in combination of heat generating means and a heat absorber for absorbing thermal radiation from the heat generating means, formed on the upstream side of the reaction chamber, and making the gas flow downstream;

again supplying the gas from the upstream side after the gas is expelled from a downstream side of the reaction chamber; and

heating a substrate to be processed that is held on the downstream side of the reaction chamber while the gas is being circulated;

wherein said heat generating means is covered with said heat absorber.

51 (Original). A method according to claim 50, wherein said gas is selected from nitrogen and rare gases.

52 (Original). A method according to claim 50, wherein said gas is one of reducing gases.

53 (Original). A method according to claim 50, wherein said gas is one of oxidizing gases.

54 (Currently Amended). A heat treatment method comprising:

supplying a gas from an upstream side of a reaction chamber;

heating the gas by using a heat treatment means formed in combination of heat generating means and a heat absorber for absorbing thermal radiation from the heat generating means, formed in the upstream side of the reaction chamber, and making the gas flow downstream;

supplying the gas expelled from an exhaust portion of the reaction chamber to an intake portion;

heating a substrate to be processed that is disposed in the reaction chamber by using the heated gas while the gas is being circulated;

wherein said heat generating means is covered with said heat absorber.

55 (Original). A method according to claim 54, wherein said gas is selected from nitrogen and rare gases.

56 (Original). A method according to claim 54, wherein said gas is one of reducing gases.

57 (Original). A method according to claim 54, wherein said gas is one of oxidizing gases.

58 (Previously Presented) A heat treatment method comprising:

disposing a substrate in a processing chamber;

supplying a gas from gas supply means to first gas heat treatment means,
through a heat exchanger;

heating the gas by using the first gas heat treatment means;

supplying the heated gas to a first processing chamber;

heating the gas expelled from the first processing chamber by using second
gas heat treatment means;

supplying the heated gas to a second processing chamber; and

supplying the gas expelled from the second processing chamber to the heat
exchanger.

59 (Original). A method according to claim 58, wherein said gas is selected from
nitrogen and rare gases.

60 (Original). A method according to claim 58, wherein said gas is one of reducing
gases.

61 (Original). A method according to claim 58, wherein said gas is one of oxidizing
gases.

62 (Previously Presented). A method of heat treating using n (where $n > 2$)
processing chambers and n gas heat treatment means, comprising:

disposing a substrate in a processing chamber;

supplying a gas heated by the m-th (where $1 \leq m \leq (n-1)$) gas heat treatment means to the m-th processing chamber;

heating the gas supplied to the m-th processing chamber by using the (m+1)-th heat treatment means, and supplying the heated gas to the (m+1)-th processing chamber;

supplying the gas supplied to the n-th processing chamber to a heat exchanger, and

heating the substrate disposed in the n-th processing chamber by using the gas supplied from gas supply means as a heat source.

63 (Original). A method according to claim 62, wherein said gas is selected from nitrogen and rare gases.

64 (Original). A method according to claim 62, wherein said gas is one of reducing gases.

65 (Original). A method according to claim 62, wherein said gas is one of oxidizing gases.

66 (Previously Presented). A heat treatment method comprising:
disposing a substrate in a processing chamber;
supplying a gas from first gas supply means to first gas heat treatment means, through a heat exchanger;

heating the gas by using the first gas heat treatment means;
supplying the heated gas to a first processing chamber;
heating the gas expelled from the first processing chamber by using second gas heat treatment means;
a heat treatment period for supplying the heated gas to a second processing chamber;
supplying the gas from second gas supply means to the first processing chamber and to the second processing chamber, without going through the heat treatment means; and
a cooling period for cooling the substrate disposed in the processing chamber.

67 (Original). A method according to claim 66, wherein said gas is selected from nitrogen and rare gases.

68 (Original). A method according to claim 66, wherein said gas is one of reducing gases.

69 (Original). A method according to claim 66, wherein said gas is one of oxidizing gases.

70 (Previously Presented). A method of heat treating using n (where $n > 2$) processing chambers and n gas heat treatment means, comprising:

disposing a substrate in a processing chamber;

supplying a gas supplied from first gas supply means and heated by the m-th (where $1 \leq m \leq (n-1)$) heat treatment means to the m-th processing chamber;

heating the gas supplied to the m-th processing chamber by using the (m+1)-th heat treatment means, and supplying the heated gas to the (m+1)-th processing chamber;

supplying the gas supplied to the n-th processing chamber to a heat exchanger;

a heat treatment period for heating the substrate disposed in the n-th processing chamber, using the gas supplied from gas supply means as a heat source;

supplying a cooling gas from second gas supply means to the n-th processing chamber; and

a cooling period for cooling the substrate disposed in the n-th processing chamber.

71 (Original). A method according to claim 70, wherein said gas is selected from nitrogen and rare gases.

72 (Original). A method according to claim 70, wherein said gas is one of reducing gases.

73 (Original). A method according to claim 70, wherein said gas is one of oxidizing gases.

74 (Previously Presented). A method according to claim 46, wherein a semiconductor film is provided at said substrate to be processed.

75 (Previously Presented). A method according to claim 50, wherein a semiconductor film is provided at said substrate to be processed.

76 (Previously Presented). A method according to claim 54, wherein a semiconductor film is provided at said substrate to be processed.

77 (Previously Presented). A method according to claim 58, wherein a semiconductor film is provided at said substrate.

78 (Previously Presented). A method according to claim 62, wherein a semiconductor film is provided at said substrate.

79 (Previously Presented). A method according to claim 66, wherein a semiconductor film is provided at said substrate.

80 (Previously Presented). A method according to claim 70, wherein a semiconductor film is provided at said substrate.

81(Currently Amended). A method according to claim 46, wherein the gas flows in ~~from~~ a direction perpendicular to the substrate to be processed.

82(Currently Amended). A method according to claim 50, wherein the gas flows in ~~from~~ a direction perpendicular to the substrate to be processed.

83(Currently Amended). A method according to claim 54, wherein the gas flows in ~~from~~ a direction perpendicular to the substrate to be processed.

84(Currently Amended). A method according to claim 58, wherein the gas flows in ~~from~~ a direction perpendicular to the substrate.

85(Currently Amended). A method according to claim 62, wherein the gas flows in ~~from~~ a direction perpendicular to the substrate.

86(Currently Amended). A method according to claim 66, wherein the gas flows in ~~from~~ a direction perpendicular to the substrate.

87(Currently Amended). A method according to claim 70, wherein the gas flows in ~~from~~ a direction perpendicular to the substrate.

88(Currently Amended). A method according to claim 46, further comprising:
making the gas flow through pores of an orifice plate over the substrate.

89(Currently Amended). A method according to claim 50, wherein further comprising: making the gas flow through pores of an orifice plate over the substrate.

90(Currently Amended). A method according to claim 54, wherein further comprising: making the gas flow through pores of an orifice plate over the substrate.

91(Currently Amended). A method according to claim 58, wherein further comprising: making the gas flow through pores of an orifice plate over the substrate.

92(Currently Amended). A method according to claim 62, wherein further comprising: making the gas flow through pores of an orifice plate over the substrate.

93(Currently Amended). A method according to claim 66, wherein further comprising: making the gas flow through pores of an orifice plate over the substrate.

94(Currently Amended). A method according to claim 70, further comprising: making the gas flow through pores of an orifice plate over the substrate.

95 (New). A method according to claim 50, wherein the substrate is heated so that the gas is provided to the substrate from an upside of a surface of the substrate.

96 (New). A method according to claim 54, wherein the substrate is heated so that the gas is provided to the substrate from an upside of a surface of the substrate.

97 (New). A method according to claim 46, wherein the substrate is processed by a sheet processing.

98 (New). A method according to claim 50, wherein the substrate is processed by a sheet processing.

99 (New). A method according to claim 54, wherein the substrate is processed by a sheet processing.

100 (New). A method according to claim 58, wherein the substrate is processed by a sheet processing.

101 (New). A method according to claim 62, wherein the substrate is processed by a sheet processing.

102 (New). A method according to claim 66, wherein the substrate is processed by a sheet processing.

103 (New). A method according to claim 70, wherein the substrate is processed by a sheet processing.

104 (New). A method according to claim 46, wherein the circulating gas from the downstream side of the reaction chamber to the upstream side is heated by a heater which is different from said heat treatment means.

105 (New). A method according to claim 50, wherein the circulating gas from the downstream side of the reaction chamber to the upstream side is heated by a heater which is different from said heat treatment means.

106 (New). A method according to claim 54, wherein the circulating gas from the downstream side of the reaction chamber to the upstream side is heated by a heater which is different from said heat treatment means.

R-126 107
~~104~~ (New). A method according to claim 58, wherein the circulating gas from the downstream side of the reaction chamber to the upstream side is heated by a heater which is different from said heat treatment means.

R-126 108
~~105~~ (New). A method according to claim 62, wherein the circulating gas from the downstream side of the reaction chamber to the upstream side is heated by a heater which is different from said heat treatment means.

R-126 109
~~106~~ (New). A method according to claim 66, wherein the circulating gas from the downstream side of the reaction chamber to the upstream side is heated by a heater which is different from said heat treatment means.

R-126

110

~~107~~ (New). A method according to claim 70, wherein the circulating gas from the downstream side of the reaction chamber to the upstream side is heated by a heater which is different from said heat treatment means.